



ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 - (217) 782-2829
JAMES R. THOMPSON CENTER, 100 WEST RANDOLPH, SUITE 11-300, CHICAGO, IL 60601 - (312) 814-6026

DOUGLAS P. SCOTT, DIRECTOR

217/782-1654

May 6, 2009

U.S. Environmental Protection Agency
Region 5
Attn: Acquisition and Assistance Branch, MC-10J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Re: FY09 American Recovery and Reinvestment Act
604(b) Water Quality Management Planning

Dear Sir or Madam:

Enclosed please find our application and workplan for FY09 American Recovery and Reinvestment Act Clean Water Act Section 604(b) grant funding. The application is for \$1,790,300, of which \$20,000 is for in-kind services.

The IEPA requests that the Region use in-kind funding for work to be performed by Tetra Tech Inc. on the macroinvertebrate Index of Biotic Integrity project. A description of work for this project is included in the attached workplan.

The application requests a project and budget period start date of April 1, 2009 to allow for pre-award costs incurred on the dissolved oxygen monitoring project. The expeditious ordering of monitoring supplies and equipment was required in order to begin work this summer.

If you have any questions or need additional information please contact Rosie Kellus at the above telephone number.

Sincerely,


Marcia T. Willhite
Chief
Bureau of Water

cc: Darlene Lewis, MC-10J
Alicia Hernandez, WS-15J

bcc: Jori Taylor, William Tansey, Rosie Kellus, Willa Barger, Gregg Good, Amy W.

ROCKFORD - 4302 North Main Street, Rockford, IL 61103 - (815) 987-7760 • DES PLAINES - 9511 W. Harrison St., Des Plaines, IL 60016 - (847) 294-4000
ELGIN - 595 South State, Elgin, IL 60123 - (847) 608-3131 • PEORIA - 5415 N. University St., Peoria, IL 61614 - (309) 693-5463
BUREAU OF LAND - PEORIA - 7620 N. University St., Peoria, IL 61614 - (309) 693-5462 • CHAMPAIGN - 2125 South First Street, Champaign, IL 61820 - (217) 278-5800
COLLINSVILLE - 2009 Mall Street, Collinsville, IL 62234 - (618) 346-5120 • MARION - 2309 W. Main St., Suite 116, Marion, IL 62959 - (618) 993-7200

APPLICATION FOR FEDERAL ASSISTANCE

1. TYPE OF SUBMISSION:		2. DATE SUBMITTED MAY - 6 2009	Applicant Identifier DUNS #807 648 654
Application <input type="checkbox"/> Construction <input type="checkbox"/> Preapplication Construction <input checked="" type="checkbox"/> Non-Construction <input type="checkbox"/> Non-Construction		3. DATE RECEIVED BY STATE	State Application Identifier NOT YET ASSIGNED
		4. DATE RECEIVED BY FEDERAL AGENCY	Federal Identifier NOT YET ASSIGNED
5. APPLICANT INFORMATION			
Legal Name IL. ENVIRONMENTAL PROTECTION AGENCY		Organizational Unit BUREAU OF WATER	
Address (give city, county, state and zip code) 1021 NORTH GRAND EAST P.O. BOX 19276 SPRINGFIELD IL 62794-9276		Name and Telephone Number of the person to be contacted on matters involving this application (give area code) MARCIA T. WILLHITE (217)782-1654	
6. EMPLOYER IDENTIFICATION NUMBER (EIN): 37-6002057		7. TYPE OF APPLICANT: (enter appropriate letter in box) <input checked="" type="checkbox"/> A A. State H. Independent School District B. County I. State Controlled Institution of Higher Learning C. Municipal J. Private University D. Township K. Indian Tribe E. Interstate L. Individual F. Intermunicipal M. Profit Organization G. Special District N. Other - Specify:	
8. TYPE OF APPLICATION <input checked="" type="checkbox"/> New <input type="checkbox"/> Continuation <input type="checkbox"/> Revision If Revision, enter appropriate letter(s) in box(es) A. Increase Award B. Decrease Award C. Increase Duration D. Decrease Duration E. Other - specify:		9. NAME OF FEDERAL AGENCY U.S. ENVIRONMENTAL PROTECTION AGENCY	
10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NO.: TITLE: WATER QUALITY MANAGEMENT PLANNING 66.454		11. DESCRIPTIVE TITLE OF APPLICANT'S PROJECT: AMERICAN RECOVERY AND REINVESTMENT ACT CWA SECTION 604(B) WATER QUALITY MANAGEMENT PLANNING	
12. AREAS AFFECTED BY PROJECT (Cities, Counties, States, etc.) STATEWIDE			
13. PROPOSED PROJECT		14. CONGRESSIONAL DISTRICT OF:	
Start Date 4/1/2009	Ending Date 12/31/2011	a. Applicant 18TH	b. Project STATEWIDE
15. ESTIMATED FUNDING:		16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS? (check one)	
a. Federal	1,770,300.00	a. <input checked="" type="checkbox"/> YES - THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW. IF YES, PROVIDE DATE OF REVIEW: MAY - 6 2009	
b. Applicant		b. <input type="checkbox"/> NO - PROGRAM IS NOT COVERED BY EO 12372 <input type="checkbox"/> OR PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW	
c. State	0.00	17. IS THE APPLICANT DELINQUENT ON ANY FEDERAL DEBT? (check one)	
d. Local		<input type="checkbox"/> YES (If "YES," attach explanation) <input checked="" type="checkbox"/> NO	
e. Other In Kind Services	20,000.00		
f. Program Income			
g. TOTAL	\$1,790,300.00		
18. To the best of my knowledge and belief, all data in this application/preapplication are true and correct. The document has been duly authorized by the governing body of the applicant and the applicant will comply with the attached assurances if the assistance is awarded.			
a. Typed Name of Authorized Representative DOUGLAS P. SCOTT		b. Title DIRECTOR	c. Telephone Number (217) 782-3397
d. Signature of Authorized Representative 		e. Date Signed 5/6/09	

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Standard Form 424 (REV. 4/92)
Prescribed by OMB Circular A-102

BUDGET INFORMATION - Non-Construction Programs

OMB Approval No. 0348-0044

Section A - BUDGET SUMMARY						
Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		Total (g)
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	
SECTION 604(b)	66.454			\$1,770,300.00	\$0.00	\$1,770,300.00
2.						\$0.00
3.						\$0.00
4.						\$0.00
5. TOTALS				\$0.00	\$0.00	\$1,770,300.00
Section B - BUDGET CATEGORIES						
6. Object Class Categories	GRANT PROGRAM, FUNCTION, OR ACTIVITY					Total (5)
	(1)	(2)	(3)	(4)		
a. Personnel						\$0.00
b. Fringe Benefits						\$0.00
c. Travel						\$0.00
d. Equipment						\$0.00
e. Supplies						\$0.00
f. Contractual						\$1,770,300.00
g. Construction						\$0.00
h. Other - In Kind						\$20,000.00
i. Total Direct Charges (sum of 6a - 6h)						\$1,790,300.00
j. Indirect Charges						\$0.00
k. TOTALS (sum of 6i and 6j)						\$1,790,300.00
7. Program Income						\$0.00

Section C - BUDGET SUMMARY					
(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) TOTALS	
	\$0.00				\$0.00
9.					\$0.00
10.					\$0.00
11.					\$0.00
12.	TOTAL (sum of lines 8 through 11)	\$0.00	\$0.00	\$0.00	\$0.00
Section D - FORECASTED CASH NEEDS					
	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	\$885,150.00	\$221,288.00	\$221,288.00	\$221,287.00	\$221,287.00
14. Non-Federal	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
15. TOTAL (sum of lines 13 and 14)	\$885,150.00	\$221,288.00	\$221,288.00	\$221,287.00	\$221,287.00
Section E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT					
		FUTURE FUNDING PERIODS (YEARS)			
(a) Grant Program	(a) First	(b) Second	(c) Third	(d) Fourth	
0	\$885,150.00	\$0.00	\$0.00	\$0.00	\$0.00
17.					
18.					
19.					
20.	TOTAL (sum of lines 16-19)	\$885,150.00	\$0.00	\$0.00	\$0.00
Section F - OTHER BUDGET INFORMATION (Attach additional sheets if necessary)					
21. Direct Charges:	\$0.00	22. Indirect Charges:	\$0.00		
23. Remarks:	Personal Services	\$0.00			
	Fringes	\$0.00			
		\$0.00			

Revised August 20, 2009

Illinois Environmental Protection Agency
Work Plan for
Water Quality Management Planning
Activities Funded Through the
American Recovery and Reinvestment Act of 2009

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY:

Precision Estimates of Macroinvertebrate and Fish Indexes of Biological Integrity – Cost: \$20,000

IEPA continues to refine its macroinvertebrate Index of Biotic Integrity (macroinvertebrate-IBI) and fish Index of Biotic Integrity (fish-IBI) for the primary purposes of determining attainment and non-attainment of aquatic life uses and the causes of non-attainment. Improving both of these IBIs also helps establish a sound foundation from which to develop tiered aquatic life uses and associated biological water-quality standards. The added complexity of a tiered set of aquatic life uses for Illinois streams will require additional refinement of the IBIs in order to precisely and accurately identify attainment/non-attainment in each biological tier. Current IBIs become more interpretable and thus more useful as their precision becomes better understood and directly quantifiable. Precision estimates help define the amount of uncertainty in an IBI score, thereby providing a measure of confidence in decisions based on IBIs.

This project will provide for the development of a final report that will document the results of a technical analysis that determines precision of IEPA's macroinvertebrate Index of Biotic Integrity (macroinvertebrate-IBI) and the fish Index of Biotic Integrity (fish-IBI). Duration of this project is through December 31, 2009.

The contracted party will conduct a pre-analysis conference call with IEPA's Surface Water Section (SWS) technical staff to discuss data formatting needs, data transfer and analysis expectations and limitations. SWS staff will provide repeat samples collected from the same site during the same sample index period as well as samples collected from the same sites over multiple years following procedures in the approved Bureau of Water Quality Assurance Project Plan: *Integrated Water Monitoring Program Document (1994)*. Data will be provided in an agreed upon format.

Across as wide a scoring range as practicable, the contractor will determine the minimum magnitude of departure (e.g., IBI score ± 10) that represents a meaningful difference in biological integrity between any two individual IBI scores. The contracted party will make this determination for both the fish-IBI and the macroinvertebrate-IBI.

The contracted party will conduct a post-analysis conference call with Surface Water Section technical staff to discuss results and analysis limitations. The contracted party will then submit draft reports for SWS technical staff review. Subsequent to addressing all review comments, the contractor will submit hard copy and electronic copies of the final report for Agency use and distribution.

In summary, IEPA will provide fish and macroinvertebrate data in electronic format to the contracted party by July 15, 2009. The contracted party will conduct analysis and provide a draft technical report by October 31, 2009. IEPA will provide review comments by November 31, 2009. The contracted party will provide final report by December 31, 2009.

A final Scope of Work for this project was forwarded to Dean Maraldo, USEPA Region 5, from Gregg Good, Illinois EPA, in an e-mail dated May 29, 2009. This Scope of Work can be found in Attachment A.

ISWS Continuous D.O./Temp and Water Sample Collection Project – Cost: \$687,304

To help establish the status and define trends in the State's water quality the IEPA operates a program known as the Intensive Basin Survey (IBS). The IBS identifies 36 basins throughout the state where the IEPA, working in conjunction with Illinois Department of Natural Resources (IDNR) staff, collect comprehensive data regarding the basin's water quality and aquatic biota. Under the IBS, each basin is monitored on a five-year rotation.

This project will fund Illinois State Water Survey (ISWS) staff to assist in collecting additional water quality data at the IBS sites for a period of three years. This and related IEPA efforts will provide data necessary to assess recent changes to the Illinois dissolved oxygen (DO) standard, assist in the development of required nutrient criteria, and in general allow the IEPA to provide a more comprehensive assessment of the State's water quality.

ISWS staff will collect continuous DO information, discharge measurements, and water quality samples from approximately 90-100 IBS sites following procedures in the Bureau of Water *Quality Assurance Project Plan: Integrated Water Monitoring Program Document (1994)*. These sites are associated with the 36 basins IEPA uses for the rotating IBS and will follow schedules identified by the IEPA. Over the three year period, data will be collected at approximately 270-300 different stream sites.

ISWS staff will install and operate continuous water quality monitoring instrumentation (sondes) at approximately 90-100 IBS sites each year for the three year period of June 1, 2009 through October 15th, 2011. All data for this project will be collected between June 1st and October 15th of each year. Each monitoring period will be at least seven consecutive days, and each site will be monitored for two seven-day periods each year. Dissolved oxygen will be monitored utilizing a single sonde at each site. Efforts will be made to ensure that the first seven-day monitoring period at each site will be completed during the period of June 1st - July 31st. The second monitoring period will be August 1st through October 15th. To the extent possible, (1) relative spacing shall be maintained so that the first sites sampled during the initial period will also be the first sites sampled during the second period, and (2) for the second monitoring period, monitoring will try to be completed by September 15th, although the index period allows for monitoring up through October 15th.

The water sample collection and field measurements for this project will follow Bureau of Water document *Standard Operating Procedures for Continuous Monitoring of Water Quality (2009)* in order to ensure that data generated by ISWS through this effort are comparable to IEPA generated IBS data. Data reduction and review will follow the procedures outlined in Wagner et. al. (2006). Prior to data collection, ISWS staff will meet with appropriate IEPA personnel to review field procedures. Water quality samples will be collected at the end of each seven-day DO monitoring period and shipped/delivered to the laboratory designated by the IEPA. Water quality samples will be provided for the analysis of total suspended solids, volatile suspended solids, ammonia, nitrate-nitrite, Total Kjeldahl Nitrogen and total phosphorus. IEPA shall provide all sample bottles necessary for delivering samples to the appropriate analytical laboratory.

The deliverables for this contract shall consist of the delivery of all unit value data as well as a reviewed and finalized continuous DO monitoring record for each seven-day monitoring period for all sites, the delivery of required samples to the appropriate laboratories and the delivery of all pertinent field notes, site logs, calibration logs and necessary chain of custody documentation to IEPA project management staff by December 31st of the year in which the data was collected. ISWS staff will maintain copies of all pertinent project documentation described above for the duration of the project. Each water year, a summary report describing data collection activities will be prepared and submitted to IEPA.

Green Infrastructure Plan for Illinois – Cost: \$300,000

Illinois has lost most of its wetlands and tallgrass prairie ecosystems. In the northeastern region, about half of the river length has been seriously disturbed and few of these waterways support healthy ecosystems. Changes in land-use have increased the volume of stormwater runoff, degrading the quality of the water resources, threatening human health and commercial interests, destroying wildlife habitats and increasing the rate and severity of flooding. In response to these challenges, significant funding and effort are being spent—both by governmental and nongovernmental agencies—on a number of “green infrastructure” initiatives to allow stormwater to be naturally managed on-site as more economical and effective alternatives that having stormwater being treated through conventional “grey infrastructure” such as the installation of stormwater sewer systems, drainage tiles and detention basins. These measures include the use of vegetated roofs, rain barrels and rain gardens, permeable paving, urban gardens and bio-swales, all designed to enhance stormwater storage and provide pollutant attenuation while also providing ecosystem services. A series of “best green practices” are also being promoted through green certification programs such as LEED-ND, including “New Urbanist” land-use and site planning practices that will be employed by local, county and regional agencies to promote clustered development, native landscaping, permeable surfaces, and detention ponds to manage stormwater impacts.

But, while these efforts are commendable, there is little consensus about which types of “green infrastructure” practices, the scales of application and institutions – municipalities, counties, special purpose units of government (such as land and water commissions, stormwater management districts, irrigation districts, etc.), or collaborative enterprises (such as an ecosystem partnership or watershed planning group) – are most effective at managing stormwater and its associated ecosystem services.

The sub-recipient for this project, The University of Illinois (UIC), the Chicago Metropolitan Agency for Planning (CMAP), will work with the Center for Neighborhood Technology (CNT), UIC will collectively assess over a one-year period multi-scale effects of “green infrastructure” standards and institutional and policy frameworks for the Illinois Environmental Protection Agency, to assist the agency in the statewide development of a Green Infrastructure Plan for Illinois. Because stormwater management practices are being so heavily promoted by county stormwater management commissions, local governments, and the Metropolitan Water Reclamation District in northeastern Illinois, the consortium will first identify state-of-the-art initiatives within northeastern Illinois that may be most transferable to communities outside of the urbanized Chicago metro area. CNT will review regulatory programs in other states or municipalities that set storm water management performance standards for private and public land-disturbing activities – including development, redevelopment and significant maintenance, replacement and repair projects in urban areas – and require or encourage the use of green

infrastructure strategies and techniques to meet those standards. The focus would be on standards for (1) water quality, (2) detention release rates, (3) infiltration, and (4) groundwater recharge. CNT will also examine the utility and feasibility of employing state portfolio standards for Green Infrastructure, as well as use a variant of their Green Values calculator to estimate some of the costs and benefits of using green compared to traditional grey infrastructure. Besides helping identify best management practices in the region, CMAP will also assess and evaluate the regulatory barriers to implementation of best management practices for stormwater management through Green Infrastructure.

Because needs for water storage, treatment, and attenuation of storm water are site-specific, creating a single, state-wide standard for storm water management may not be effective. In order to maximize the services obtained from green infrastructure and develop the best possible storm water management plan, the UIC will review existing site and large-scale monitoring data on the impact of green infrastructure and integrate it into a land-use and runoff model. This model will be used to explore how and at what spatial scale the varied approaches identified by CMAP and CNT mitigate the environmental and economic impacts of human activity and storm events in the state of Illinois. Additionally, based on sensitivity analyses with the model, UIC will identify the parameters that are most important for predicting management outcomes and any needs for future data collection and monitoring. Finally, UIC will work with the Illinois-Indiana Sea Grant College Program (affiliated with U-Illinois Extension) in developing outreach and implementation strategies for the State Green Infrastructure Plan, attempting to match a range of best management practices with the governmental (e.g., municipalities, counties, park districts) and institutional (soil and water conservation districts, irrigation districts, water resources management districts, e.g.) entities with the administrative capacity, jurisdiction, and authority to best able to carry them out at the appropriate scale. The consortium will work with the Illinois Environmental Protection Agency and the Illinois Department of Natural Resources to form a Technical Advisory Committee, to assist the state in the development and implementation of a Green Infrastructure Plan based on these explorations.

A progress report to IEPA will be produced six months from the start of the project, including findings from CMAP's and CNT's data collection and monitoring, and preliminary recommendations as to policy or institutional alternatives (including the use of portfolio standards) that can be considered to undertake Green Infrastructure Planning at substate levels. At the end of the project, we will produce a set of criteria for implementation of a green infrastructure plan for the state of Illinois, informed by the collective discussions between scientists and policy-makers around the data collected and the modeling exercises. The timing is particularly relevant in light of recent discussions on possible legislation promoting a transition to green infrastructure for storm water management. This effort will also provide employment and new interdisciplinary training to at least six students and professionals. Future work of the Technical Advisory Committee can include the development of Geographic Information Systems and other techniques of data visualization that can be employed to disseminate the state's Plan.

Illinois EPA will hold stakeholder meetings at approximately 6 months and 12 months after the project start date. The Recipient will participate at these meetings (presentations, back ground information,

and other activities as mutually agreed upon) and will collect and use the information that is gathered during these meetings, as appropriate, in the development of the project deliverables.

The Recipient will work with the Illinois EPA and the Illinois DNR to form a Technical Advisory Committee, to assist the state in the development and implementation of a Green Infrastructure Plan based on the outcome of this project and other appropriate initiatives.

The Recipient shall coordinate a consortium to implement this project. The consortium shall include, but is not limited to: the Chicago Metropolitan Agency for Planning, the Center for Neighborhood Technology, and the Illinois-Indiana Sea Grant College Program.

The consortium shall:

1. Collectively assess multi-scale effects of “green infrastructure” standards and institutional and policy frameworks.
2. Conduct research and provide a summary of their findings to Illinois EPA to support the development of a Green Infrastructure Plan for Illinois. The research will be limited to the topics identified in this document and other topics as mutually agreed to by both parties.
3. Identify state-of-the-art initiatives within northeastern Illinois that may be most transferable to communities outside of the urbanized Chicago metro area. Identify the potential benefits and drawbacks of green infrastructure initiatives.
4. Review regulatory programs in other states or municipalities that set storm water management performance standards for private and public land-disturbing activities – including development, redevelopment and significant maintenance, replacement and repair projects in urban areas – and require or encourage the use of green infrastructure strategies and techniques to meet those standards. The focus would be on standards for (1) water quality, (2) detention release rates, (3) infiltration, and (4) groundwater recharge.
5. Document the extent to which existing county stormwater ordinance and /or Phase II NPDES MS4 permits address green infrastructure in Illinois.
6. Examine the utility and feasibility of employing state portfolio standards for Green Infrastructure, as well as use a variant of the Center for Neighborhood Technology’s Green Values calculator to estimate some of the costs and benefits of using green compared to traditional grey infrastructure.
7. Help identify Green Infrastructure best management practices (currently used) in the region.
8. Assess and evaluate the regulatory barriers to implementation of Green Infrastructure best management practices for stormwater management.
9. Review existing site and large-scale monitoring data on the impact of green infrastructure and integrate it into a land-use and runoff model. This model will be used to explore how and at what spatial scale varied approaches mitigate the environmental and economic impacts of human activity and storm events in the state of Illinois.
10. Identify the parameters that are most important for predicting management outcomes and any needs for future data collection and monitoring based on sensitivity analyses from modeling.
11. Develop outreach and implementation strategies for the State Green Infrastructure Plan, as possible, match a range of best management practices with the governmental (e.g., municipalities, counties, park districts) and institutional (soil and water conservation districts,

- irrigation districts, water resources management districts, e.g.) entities with the administrative capacity, jurisdiction, and authority to best able to carry them out at the appropriate scale.
12. Produce a set of criteria for implementation of a green infrastructure plan for the state of Illinois.
 13. Conduct all activities necessary to meet the interim and final report requirements.

As required by the Bureau of Water's Quality Assurance Project Plan: Integrated Water Monitoring Program document (1994) the UIC will develop a Secondary Data QAPP to be reviewed and approved by Illinois EPA, due September 30, 2009.

Project start date: July 1, 2009

Project end date: September 30, 2010

INTERAGENCY/AREAWIDE PLANNING AGENCY PASS-THROUGH:

Upper Mississippi River Basin Association (UMRBA) Water Quality Standards and Assessment, Nutrient-Related Efforts, and Cross-Program Collaboration and Coordination – Cost: \$110,000

The Upper Mississippi River Basin Association (UMRBA) is a regional interstate organization formed by the Governors of Illinois, Minnesota, Wisconsin (each in USEPA Region 5) Missouri, and Iowa (each in USEPA Region 7) to coordinate the states' river-related programs and policies and work with federal agencies that have river responsibilities. UMRBA is involved with programs related to ecosystem restoration, hazardous spills, and water quality, as well as floodplain management and flood control, commercial navigation, and water supply.

The UMRBA supports and provides staff for two work groups, the Water Quality Task Force (WQTF) and the Water Quality Executive Committee (WQEC), which provide forums for consultation among the five state water quality management agencies, as well as Regions 5 and 7 of the USEPA. Both groups address issues directly related to the states' Clean Water Act responsibilities on the Mississippi River as a shared interstate resource, including monitoring, waterbody assessments, listings of impaired waters, and total maximum daily loads (TMDLs). The distinction between the groups is that the WQTF examines issues at a technical/program level, while the WQEC functions at a policy level and seeks to implement the approaches identified by the Task Force. The efforts of these groups have enhanced interstate cooperation in Clean Water Act implementation and resulted in a number of reports regarding Upper Mississippi River water quality issues. (See <http://www.umrba.org/wq.htm> for more details.)

Working with WQEC and WQTF members from each of the five states, UMRBA proposes an ambitious, collaborative \$252,000 combined project that focuses on three primary efforts for the benefit of the UMR. In summary, funds will be used to (1) develop a biological assessment guidance document for the UMR, (2) craft a synthesis report that summarizes nutrient data, examines what is known about the

“local” impacts of nutrients, and offers recommendations for improved nutrient monitoring, and (3) continue cross-program collaboration and coordination activities with other UMR-focused programs.

Each of the five UMRBA states is submitting applications to their respective USEPA Regional Office (R5 and R7) for 604(b) funding to implement this combined \$252,000 effort. The detailed project proposal that all states will submit can be found in Attachment B. All activities described in the proposal will be completed no later than December 31, 2011.

Chicago Metropolitan Agency for Planning – Watershed-based Planning and Water Quality Monitoring – Cost: \$672,996

Chicago Metropolitan Agency for Planning (CMAP) as a designated Areawide Water Quality Planning Agency (CWA 208) will serve as the central lead agency, the Recipient shall direct and review the individual monitoring and watershed-based planning projects proposed under this Agreement. The Recipient shall provide financial and technical assistance to the Fox River Study Group, The Conservation Foundation, and The Hickory Creek Watershed Planning group during the implementation of the various activities described under this Agreement.

Project start date: June 15, 2009

Project end date: August 1, 2011

**Hickory Creek Watershedbased Plan Development
Problem Statement**

The Hickory Creek watershed is experiencing the pressure of rapid urbanization. Will County is one of the two fastest growing counties in Illinois, and is forecast to increase by 114 percent from 2000 to 2030 (McHenry is the next fastest growing county, with a forecasted 76 percent population increase for the same 30-year period). New Lenox alone is expected to experience a five-fold population increase to more than 90,000 by 2030. As a result of recent fast-paced development, Hickory Creek has been experiencing heavy silt load pollution due to construction, increasing stormwater volumes increasing erosion, replacement of natural drainage with storm sewer systems, and increasing discharges of treated wastewater. For these reasons, Hickory Creek is a “very high priority” of the Chicago Wilderness Biodiversity Recovery Plan and is included on the State’s 303(d) list.

Much has been accomplished on a municipal basis throughout the watershed. However, to date there has been very little cooperation and sharing of information between townships. When we consider the increasing threats posed to this watershed, collaboration and cooperative planning are essential to its protection. The following document details the steps of our long-term goal to work collaboratively and plan accordingly for the protection of the Hickory Creek watershed. This planning project will include the entire Hickory Creek watershed and will focus on gathering background information through surveys on public perception of the creek and by creating a clearing house of information and data collected over the years, including restoration projects and outreach efforts that individual government bodies and watershed groups have performed. This information will then be used to take a holistic look at the achievable water quality and habitat improvements, and engage a wide range of audiences in the effort. It will

also demonstrate how modest, voluntary green infrastructure investments can begin the process of reducing stormwater runoff and nonpoint source pollution loads while increasing stream base flows and groundwater recharge.

This project will reinforce the relationships necessary for the successful creation of the Hickory Creek Watershed Plan, gather critical information that will be used in the planning process and ignite interest within the watershed communities and partners by proving highly visible demonstrations of the collaborative efforts occurring.

At 107 square miles, the Hickory Creek watershed is large and complex. Many of the issues at hand pertain to all of the local municipalities, all of which can benefit from the Project. Future projects that result from the larger watershed plan may focus on remediation of specific conditions and will likely be limited to subwatersheds.

- *Waterbody Name:* Hickory Creek.
- *Illinois EPA Waterbody Identification Code:* HUC 10 0712000406. (For the Codes of segments and tributaries, see Table 1, below.)
- *Waterbody Size:* Hickory Creek's main stem is approximately 27 miles long. There are 25 tributaries to the main channel with 83 branches and 140 linear miles of stream.
- *Watershed Size:* 107 square miles.
- *Gradients:* The average stream gradient is 9.7 feet per mile.
- *Flows:* The annual mean stream flow at the Joliet gauge since 1945 has ranged from 20.1 cfs in 1963 to 149 cfs in 1974.
- *Geomorphology:* Two-thirds of the 107 square miles of land drained by Hickory Creek lie on the Valparaiso Moraine formed by the Wisconsin glaciation. The mouth area of Hickory Creek where it joins the Des Plaines River lies on the Lake Chicago Outlet and Lake Waubesa stage of the Kankakee Flood. The source areas of Hickory Creek lie on glacial lake sediments at the leading edge of the Tinley Moraine. Glacial Lakes Orland, Tinley, Matteson, and Steger once discharged to the headwaters of the primitive Hickory Creek Drainage System.
- *Groundwater/Surface Water Interactions:* Five Joliet gravel wells are in a delineated recharge area in the lower Hickory Creek watershed.
- *Hydrology:* About half of the watershed still consists of open space or agricultural land. The other half is urbanized. There are nine sewage treatment plants in the upper Hickory Creek watershed, with combined capacity of approximately 10 million gallons per day.
- *Project Location:* Will County – Homer, Joliet, New Lenox, Frankfort, and Monee Townships; Cook County – Orland and Richton Townships.
- *Illinois EPA's Priority Status:* Hickory Creek is listed as having a Medium Priority.
- *Severity of the Problem:* Hickory Creek is one of 18 streams classified by the Chicago Wilderness Biodiversity Recovery Plan as having a "very high priority" for protection or restoration and having species of concern. Recommended actions in the Recovery Plan to protect these streams include: 12 measures that improve watershed and stormwater management to reduce hydrologic alteration; seven measures to reduce the deterioration of habitat quality; and 10 measures to reduce the deterioration of water quality.
- *Key Factors Affecting Use Support:* Hickory Creek is on the State's 303(d) list because of high levels of phosphorus, chloride, sedimentation/siltation, silver, total dissolved solids, zinc, manganese, mercury and fecal coliform, as well as low levels of dissolved oxygen. Area residents and experts have observed excessive and offensive algae blooms in the creek. (See Table 1, below, for more detail.)
- *Seasonal Assessment of Use Impacts:* None known.

- *Major Pollutant Sources:* Heavy silt loads to the streams, increasing stormwater volumes due to development of impervious surfaces, increasing erosion due to construction, replacement of natural drainage with storm sewer systems, and increasing discharges of treated wastewater.
- *Land Uses:* According to the Northeastern Illinois Planning Commission (NIPC) 1995 Land Use Report: agricultural land – 45 percent, open space – 9 percent, private vacant and wetlands – 14 percent, urban, built-up land – 32 percent, water – 0.5 percent.
- *Relationship of Land Use/Management to Water Quality Impacts:* Illinois' native soils were built by thirsty, deep-rooted vegetation that could withstand drought and fire and by vast wetlands. Stormwater entered the streams primarily through the soils, not over land. When sodbusters converted the land to shallow-rooted annual crops, less water infiltrated the soil and more ran off, taking soil with it. Drain tiles proliferated and ditches carried the "land soup." When developers convert the land to impervious roofs and pavement, with shallow-rooted lawns, pollutant-laden water races into the streams. If we can convert even a fraction of our landscapes so that infiltration increases and runoff decreases, we can preserve some of the qualities of our streams and create a variety of neighborhood spaces that bring a greater awareness of the natural environment into our daily lives.
- *Climate and Important Meteorological Factors:* Regional information on climate and precipitation data is available and will be used.
- *Soil Types, Geology and Slopes:* Generally silty and clayey soils on uplands and lake plains.

Segment ID	Waterbody Name	Miles/Acres	Designated Use	Potential Cause(s)*
IL_GG-04	Hickory Cr.	7.84	Aquatic Life	Chloride, Phosphorus (Total)
IL_GG-06	Hickory Cr.	12.15	Aquatic Life	Chloride, Phosphorus (Total)
IL_GG-22 Joliet St bridge 0.25 mi W of SR 53 bridge on S edge of Joliet Will Co. Lat. 41.5077 Long. -88.0839	Hickory Cr.	2.27	Aquatic Life Primary Contact Recreation	Chloride, Phosphorus (Total), Sedimentation/Siltation, Silver, Total Suspended Solids (TSS), Zinc Fecal Coliform
IL_GGA-02	Spring Cr.	15.26	Aquatic Life	Manganese, Dissolved Oxygen (Nonpollutant)*, Phosphorus (Total), Sedimentation/Siltation
IL_GGC-FN-A1	Union Ditch	4.39	Aquatic Life	Dissolved Oxygen (Nonpollutant)*, Sedimentation/Siltation

IL_GGC-FN-C1	Union Ditch	1.18	Aquatic Life	Ammonia (Total), Chloride, Dissolved Oxygen (Nonpollutant)*, Phosphorus (Total), Sedimentation/Siltation
IL_GGF	Frankfort Trib.	4.09	Aquatic Life	Phosphorus (Total)
IL_RGZZ	SEDGEWICK	75.00	Aesthetic Quality Fish Consumption	Total Suspended Solids (TSS) Mercury
IL_GGB-01	Marley Cr.	10.01	Not assessed	

Hickory Creek is an excellent case study of the challenges of preserving stream quality in the path of development. In the early 1900s, scientists found treasures in the creek's water: fish, mussels, salamanders, and other animals that comprised a nearly intact ecosystem. Hickory Creek became the most studied high-quality stream in the region and scientists uncovered many of the secrets that govern life in running water. More than twenty years ago, Dr. David Bardack of the University of Illinois wrote, "Hickory Creek has attained a status of a classic biological study area. It has shaped the understanding of ecologists of the basic principles of stream faunal succession."

Today, Hickory Creek is still a place where people dip their fishing lines, children learn about the wonders of nature and the environment, and scientists collect their samples. But many of the Creek's most sensitive life forms have disappeared in the face of discharges from wastewater treatment plants, development within the watershed, and other assaults. In addition, local residents and visitors are losing their connection with the stream.

Hickory Creek now stands at a critical juncture in its history. Although far from pristine, it still contains a robust ecology otherwise gone from most of the areas engulfed by suburban sprawl. To find the best streams, one must leapfrog the miles of subdivisions and malls to the ever-shrinking rural parts of Kendall, Will, and Kane counties. But a growing effort by local citizens to protect this crucial natural resource could mean that it is not too late to save Hickory Creek. If we can accomplish that noble task, we will have given our children and their children a great gift, and we will have learned much at the same time. And those throughout the region will have benefited.

Project Description and Purpose:

The Project will gather baseline information on public perception and use of the Creek as well as gather information on changes and perception after the project is completed. The project will also bring together the wide variety of information that has been generated about Hickory Creek so that it can be effectively used to reduce nonpoint source pollution, achieve water quality and habitat improvements, and engage a wide range of audiences in these efforts. It will also demonstrate how modest, voluntary green infrastructure investments can begin the process of reducing stormwater runoff and nonpoint source pollution loads while increasing stream base flows and groundwater recharge.

With increasing populations in urban areas come increases in the demands for land and water resources. In order to combine resources, share information, and effectively protect the Hickory Creek which runs through multiple municipalities, a strong cooperative effort is necessary. A major strength of this Project is the partnership that began in 2008 in order to begin watershed planning for Hickory Creek. The partners include:

Village of New Lenox, Village of Frankfort, Village of Homer Glen*, City of Joliet, Village of Mokena, Village of Orland Park*, Village of Tinley Park*, Forest Preserve District of Will County, Will County Stormwater Management Planning Committee, Lower Des Plaines River Ecosystem Partnership, Prairie Rivers Network, Sierra Club, and Center for Neighborhood Technology

As required by the Bureau of Water's Quality Assurance Project Plan: Integrated Water Monitoring Program document (1994) the CMAP will develop a Secondary Data QAPP to be reviewed and approved by Illinois EPA.

Scope of Work and Schedule

Task 1: Documentation of Sources of Nonpoint Source Pollutants and Preparation of Action Plans

All available studies of Hickory Creek will be reviewed and from them water and habitat quality conditions throughout the watershed will be inventoried and compiled. Some water quality conditions have already been inventoried by the State, and are the reason why Hickory Creek and some of its tributaries are listed in the Illinois Water Quality Report (305b). They will be documented in this project, as well as the results of other studies of the creek and its pollution.

Using this information, probable sources of pollutants will be identified and located on a watershed map using GIS. This will be an approximate compilation, but can be used to identify sources that will need to be controlled in order to achieve load reductions that will be estimated in the ultimate watershed-based plan for Hickory Creek. The identification of sources will enable the project partners to establish action plans to begin early removal of some sources and reduction of the quantities of critical pollutants. This information will not only provide a platform for the larger watershed plan, but will also enable the sub-watersheds opportunity to make improvements while the larger plan is being developed.

A much more complete inventory, such as is necessary for a Total Maximum Daily Load (TMDL) study, can take years and large amounts of funding. What can be done during this one-year project is documentation of some important sources of NPS pollution that can become priorities for BMP implementation.

Use of GIS to locate the sources, as well as to document stream pollutant concentrations and other conditions, will facilitate development of action plans. These plans will enable local partners to effectively reduce the impacts of priority nonpoint sources of pollution. One potential example would be the identification of erosion and runoff from poorly-managed construction sites as a principal source of sediment in a stream segment. The action plan could be increased

vigilance of erosion control measures on the sites. Another potential action plan could be the reduction of runoff from an aging parking lot that causes downstream erosion.

Task 2: Estimate of load reductions expected for the management measures identified

Pollutant load reductions will be estimated using Illinois EPA worksheets and other available models for each BMP recommended for implementation.

Task 3: Description of the nonpoint source management measures recommended for implementation and identification of critical areas

Through a process using local input and information, BMPs will be identified and targeted. The individuals or parties that assume a lead role in each specific BMP will be identified.

Task 4: Estimates of the amount of technical and financial assistance needed for plan implementation

Each BMP that is recommended in the nine minimum element plan will include an estimate of the expected technical and/or financial assistance that will be necessary for implementation.

Task 5: Schedule for implementing watershed plan recommendations

BMP, information/education and other activity recommendations will be prioritized and assigned expected timeframes for implementation based upon supporting information.

Task 6: Description of interim measurable milestones

Measurable milestones will include implementations of plan recommendations, water quality assessment and social indicators of change as measures of intermediate outcomes.

Task 7: Set of criteria for determining if load reductions are occurring and water quality is improving

Proxy indicators, such as administrative or social indicators along with Illinois EPA monitoring data will be used to determine whether water quality is moving in a positive direction during Plan implementation. The specific indicators to be used will be identified during the Plan development process.

Task 8: A monitoring component to evaluate watershed plan effectiveness

Working with stakeholders and appropriate state agencies, programs and resources will be identified to develop a monitoring component as part of the planning process. The monitoring plan devised will aim to measure evaluation criteria identified in Task 7.

Task 9: Education and Outreach

One of the common interests among the members of the Hickory Creek Watershed Planning Group is learning more about measures that may be called green infrastructure or low impact development, but are also core strategies to reduce nonpoint source pollution. While we

certainly don't want to wait on the funding of the project to initiate education and outreach on these issues, there is a tremendous amount that needs to be done in order to achieve the widespread implementation that is necessary to make an impact at a watershed scale. Our proposed work will make a substantial contribution to this education and outreach. And every one of our partners will contribute to the work.

In order to get baseline information about the public use and perception of the creek, Prairie Rivers Network will assist the partnership in performing a survey of the citizens of the watershed. At project completion, another survey will be performed to evaluate the effectiveness of the project's education and outreach efforts. Findings will also be utilized to help shape outreach efforts for the final watershed plan.

Printed brochures will be prepared and distributed throughout the watershed which incorporate tools and resources offered in other resources (e.g. Center for Neighborhood Technology's Stormwater Management and Green Infrastructure", Prairie Rivers Network's "Rain Gardens for Illinois", and the Center for Neighborhood Technology's "Water: From Trouble to Treasure, A Pocket Guide to "Green" Solutions"). The pamphlet will share these and other resources, but will also be tailored specifically to the Hickory Creek watershed, educating residents about their watershed and their role in keeping it healthy.

They will highlight the importance of watershed awareness and the steps that any property owner can take to protect his or her own interests, create an attractive local environment, and be a responsible watershed neighbor. Workshops will be conducted in each municipality to encourage participation in the Project BMP installations, as well as to utilize sustainable landscaping methods. Volunteers at the demonstration sites will be celebrated, as will voluntary measures that contribute to watershed health. A website for Hickory Creek will be created and case studies, project events and other information will be posted.

The asset represented by the draft document "The Lessons of Hickory Creek" will be evaluated to determine how it can be best utilized to generate appreciation for our unique resource. Consideration has been given to publishing it as a popular booklet, to gaining its publication as a serial in a local newspaper, or even publishing it as an audio CD for taking in the car while traveling the watershed. It will be used creatively during the project.

In conjunction with an education and outreach program to reach citizens and property owners, several municipalities in the watershed have expressed interest in an analysis of their ordinances and regulations to identify potential barriers to green infrastructure use, as well as opportunities to encourage its use. The Center for Neighborhood Technology has been funded for two years to work with such municipalities and it is proposed that during the project period some of this work will be included in the project as part of the required match.

Task 10: Overall Project Evaluation and Replication

Quarterly progress and financial reports will be prepared and submitted to the IEPA. Case studies will be prepared for the demonstration sites. Evaluation of the effectiveness of local

BMPs will be discussed. And a comprehensive final report, including a plan for replicating the project elsewhere in Illinois, will be submitted.

Project start date: July 1, 2009

Project end date: July 1, 2011

Watershed Based Planning to Restore and Protect the Lower DuPage

Problem Statement

Until now, planning in the DuPage River Watershed has focused primarily on the East and West Branches of the Upper DuPage River Watershed. However, the lower portion of the DuPage River Watershed, including main stem segments IL_GB-01, IL_GB-11 and IL_GB-16, are also listed on the 2008 303(d) List of Impaired Waters. Combined, the main stem and the Lily Cache, Springbrook and Mink Creek tributaries total nearly 53 miles and are listed as not supporting or not assessed for aquatic life, fish consumption, primary contact, secondary contact and aesthetic quality. Illinois EPA (IEPA) has identified sources of impairments on the main stem to include urban runoff/storm sewers, contaminated sediments, hydrostructure flow regulation/modification, site clearance (land development or redevelopment), upstream impoundments and other unknown sources. The watershed is degraded. The 1999 DuPage River Area Assessment by the Illinois Department of Natural Resources (IDNR) states there are no biologically significant streams in the watershed. With several Total Maximum Daily Loads (TMDLs) for this stretch of the River under development (anticipated by August 2009), gathering stakeholders to both facilitate collaborative efforts and create a watershed-based plan that would incorporate the practices identified in the TMDLs and give specific guidance on appropriate implementation measures is vital. Other watershed-wide recommendations, with a goal of eliminating impairments for the entire Lower DuPage River Watershed, would also be part of the planning effort.

While the Lower DuPage River is identified as a medium priority watershed by the IEPA, it connects to Segment G-24 of the Des Plaines River that drains into Segment D-23 of the Illinois River, an IEPA target watershed area. Continued pollution in the DuPage River will exacerbate Des Plaines and Illinois River impairments. Below is a location map identifying the approximately 163 square mile Lower DuPage River Watershed and its confluence with the Des Plaines River in Channahon, Illinois.

Project Description and Purpose

Funding is needed to support a two-year project to work with local units of government, the Will/South Cook Soil and Water Conservation District and the DuPage River Ecosystem Partnership, to coordinate and build local efforts to restore and protect the water quality of the Lower DuPage River Watershed. The Conservation Foundation (TCF) will lead and complete the creation of a Lower DuPage River Watershed plan to address the "nine elements" of watershed planning outlined by the U.S. EPA and IEPA. The project also includes time and

funding for TCF to facilitate implementation. The project will be accomplished by assembling watershed stakeholders to be involved in drafting a watershed plan that includes integration of water quality improvement practices recommended in the 2009 TMDLs as well as other watershed-wide practices to improve and protect the DuPage River Watershed. These same stakeholders will also consider the benefits of on-going collaboration with TCF positioning several projects (consistent with the plan) for implementation.

As required by the Bureau of Water's Quality Assurance Project Plan: Integrated Water Monitoring Program document (1994) the TCF will develop a Secondary Data QAPP to be reviewed and approved by Illinois EPA.

Scope of Work and Schedule

To develop a sound watershed plan and implement the TMDLs, it is critical to assemble an appropriate stakeholder team. Because it is estimated 50% of the watershed is developed, with much of the remaining area slated for future development, the team to be assembled would primarily consist of staff from communities (public works/ wastewater treatment plants, planning divisions and park districts), Will, Kendall & Grundy Counties, the Forest Preserve Districts of Will and Kendall Counties, environmental groups, the Will/South Cook Soil & Water Conservation District, IDNR, University of Illinois Extension, Will County Farm Bureau and IEPA. Press releases will be submitted to local newspapers to let other watershed stakeholders know of the opportunity to be involved.

The following tasks will be completed with this watershed-based plan.

a) Identify causes and sources of pollutants.

The previous work of the 305(b) and 303(d) lists and anticipated TMDLs will be used to identify the possible causes and sources of pollutants and necessary pollutant reductions for those addressed by the TMDLs.

b) Estimate expected load reduction.

The estimate of the expected load reductions will be incorporated as the watershed plan is developed in detail. This will be accomplished using existing and projected land uses. Specifically we will use land use information available through Chicago Metropolitan Agency for Planning (CMAP) to develop expected pollutant runoff loadings for existing land uses. The consultant will determine the appropriate evaluation tool to use in estimating the expected nonpoint source runoff load reduction, including considering the NPIC/IEPA Load Reduction Estimator and WinSLAMM. The TMDL studies will be reviewed and it will be determined if they can be used to provide a more complete look at the transport of point and nonpoint pollutants in the watershed, within the budget scope of this project. The work on determining the existing loadings will be completed by an engineering or water resources consultant. Projected land use pollutant runoff loadings will be estimated using land uses identified in area comprehensive plans. Again, the consultant will determine the appropriate

evaluation tool to use in estimating how the land use change will affect runoff volumes and pollutant concentrations (L-THIA and WinSLAMM will be considered).

c) NPS management measures necessary to meet expected load reductions.

Using the information determined in the previous task, the team and the consultant will meet to review the results. Measures necessary to meet estimated load reductions will be discussed and documented along with expected load reductions by each measure. The group will prioritize areas needing attention and the management measures necessary to accomplish load reductions. Areas of proposed development or redevelopment would be considered in this ranking to determine if Best Management Practices required by existing ordinances will be adequate to mitigate increased pollutant loadings due to the development.

d) Estimated financial and technical assistance needed to implement plan.

The watershed plan will list a variety of actions that will restore and protect the watershed and downstream waters. It will also identify proposed roles and schedules for implementing the plan's provisions. The consultant will develop cost estimates for the management measures necessary on a subwatershed or community basis, using WinSLAMM or another appropriate tool. The team will decide how much technical assistance is necessary to implement the plan and identify needed workshops, technical advisors, or other methods to provide the assistance.

e) Public information/education measures in the plan.

Currently there is no coordination of outreach and education programs to help communities in the Lower DuPage River watershed. The plan will suggest a variety of public information and education measures that can be undertaken in the watershed to change behavior and increase knowledge, drawing on programs that have occurred in the Upper DuPage River Watershed through the DuPage River Coalition, The Conservation Foundation's programs in the Upper DuPage River and the TMDL Workgroup as well as programs implemented in other watersheds. Measures considered will not only meet requirements of "nine element" watershed planning, but will also seek to help communities integrate efforts with NPDES Phase II outreach and involvement requirements while addressing TMDLs.

f) Plan implementation schedule.

The project consultant will develop a plan implementation summary with assistance from the team at a scale determined by the team (for example by subwatershed, community, etc.). The summary will include the proposed measures, the expected water quality benefit of each measure, the cost of each measure, the priority ranking and the organization or unit of government designated with implementing the measure in order to meet the expected load reductions. When alternative measures can be used to meet the plan goals, those measures will be indicated. From this summary, the team can develop a plan implementation schedule. The schedule will outline measures that should be undertaken

immediately (in the next one to two years), in the near future (in the next five years), and in the long term (beyond five years).

g) Description of measurable milestones.

The team, with assistance of the project consultant, will develop measurable milestones within the plan. Examples of measurable milestones that the consultant may recommend could be tracking the implementation of recommended measures on a site-specific basis (i.e. whether recommended BMPs are employed in new subdivisions or conservation design is proposed), the number of public education activities conducted, or water quality sampling/monitoring.

h) Criteria to determine pollutant-loading reduction.

The watershed-based planning effort will include criteria that can be used to gauge the effectiveness of actions undertaken and water quality conditions in the Lower DuPage River Watershed. The criteria may be based on calculated or measured reductions or a combination of both. Other methods that may be considered could include periodic visual checks of the stream corridor, water sampling and BMP effectiveness analysis/reporting. Observations/measurements of stream bank erosion and other impacts on stream habitat will be a good indicator of whether there are higher levels of storm water runoff affecting the stream.

i) Monitoring component.

The team will identify monitoring schedules to assess the success/ effectiveness of the management measures undertaken as recommendations in the watershed plan.

Tasks d) and f) will begin the process of identifying and securing implementation funds. Once secured task f) will prioritize how these funds will be allocated.

Project start date: January 1, 2010

Project end date: June 1, 2011

Baseline Watershed Monitoring for Watershedbased Planning and TMDL Development -

Kishwaukee River (HUC 0709000602)

The Chicago Metropolitan Agency for Planning, in concert with several partner organizations, completed plans this year for three watersheds in the Kishwaukee basin using Section 319 funding from IEPA. One of these, the Upper Kishwaukee River (station/reach PQ 13), has been on the Illinois 303(d) list for the last several assessment cycles, with potential causes of impairment identified as alteration in stream-side or littoral vegetative covers, total nitrogen (2006), sedimentation and PCBs. Initial estimates prepared with a modified Spreadsheet Tool to Estimate Pollutant Loads (STEPL) model suggested that wastewater and row crops contribute most of the nutrient load. Load reductions were provisionally set at 36% of total nitrogen, 73% of phosphorus, and 56% percent of sediment influx. These conclusions are considered provisional

because the STEPL model is uncalibrated and because the paucity of water quality data points makes an estimate of average concentrations unreliable. The watershed plan recommended additional monitoring. Although nutrients are not currently listed as a potential cause of impairment the Watershed Stakeholder Group deemed them important enough to address through a preservation (Healthy Watersheds) aspect than leave them alone. With current rates of urbanization nutrient levels are expected to raise significantly in this watershed. The Watershed Stakeholder Group chose to use the U.S. EPA proposed ecosystem nutrient criteria numbers as an endpoint for load reductions needed to meet Use Support.

The overall goal of monitoring in the Kishwaukee basin is to collect concentration and flow data sufficient to estimate average nutrient loading in the study reaches on at least a monthly basis, as well as sufficient to calibrate a watershed loading model that can predict how improvements in point and nonpoint source pollution management would help meet watershed loading targets. To this end, additional samples of total nitrogen, total phosphorus, and total suspended solids. Approximately 18 ~ 24 samples per year for about four years are recommended for nutrients and sediment at the site of station PQ 13 (Pleasant Valley bridge near McCue Road). In situ measurements of temperature, pH, and dissolved oxygen should also be taken for use in modeling. The sample design should include sampling during both high and low flows to get an adequate representation of the distribution of flow and concentration. Flow measurements are also needed from a stream gaging station. Because sedimentation is one of the causes of impairment, it will also be necessary to take cross sections of the channel, about 1- 2 per year over four years, to determine the rate at which sediment is accumulating. Initial cost information developed for the watershed plan suggested that such a program could be carried out for \$165,000, but we believe the program, perhaps modified, could be carried out more economically (target cost = \$100,000). Water quality model development would be funded separately and should begin in 2013 to support an update of the Upper Kishwaukee River Watershed Plan beginning in 2014.

CMAP proposes to develop this brief summary into a full scope of work and issue an RFP for a firm or other organization to conduct the monitoring. It is our intent to prepare an approvable QAPP for this project. Finally, we will also work with the two wastewater treatment plant operators discharging to the Upper Kishwaukee to ensure they monitor and report nutrient parameters for use in later modeling.

Single site monitoring is appropriate in this small sub-watershed as the data will be supplemented by data collected from the two wastewater treatment plants in the sub-watershed. Additionally there will be no sampling of aquatic life, the purpose of the project is source identification for what is causing the impairment to aquatic life. The measurements are not being made to evaluate aquatic life. After implementation practices are installed monitoring of aquatic life use support will take place to determine effectiveness.

As required by the Bureau of Water's Quality Assurance Project Plan: Integrated Water Monitoring Program document (1994) the UIC will develop a Secondary Data QAPP to be reviewed and approved by Illinois EPA, due August 1, 2009.

Project start date: July 1, 2009
Project end date: August 1, 2011

Fox River (HUC 07120007)

The Fox River Study Group, Inc. (FRSG), an Illinois Not For Profit Corporation, has embarked on an effort to investigate water quality within the Fox River watershed that, among other things, supports development of watershed plans in the Fox basin and provides new data to update existing plans. FRSG has contracted with the Illinois State Water Survey to conduct precipitation, river gauging and ambient and storm event monitoring needed for model calibration. To contribute toward this projected \$1.16 million effort (which is now funded by casino revenues, IEPA, municipalities, and private grants), CMAP is proposing to award approximately \$100,000 to FRSG to conduct monitoring on three important tributaries to the Fox. The reaches of the tributary streams to be sampled are all on the 303(d) list and have recently had plans developed for them by CMAP or a partner organization. They include Tyler Creek (primary contact use impaired, potential cause fecal coliform), Flint Creek (aquatic life use impaired, potential causes aquatic algae, other flow regime alteration, and cause unknown), and Poplar Creek (primary contact and aquatic life uses impaired, potential causes fecal coliform, chloride, sedimentation, total suspended solids, and pH).

Routine bi-weekly sampling will occur at sites near the mouths of the streams. To the extent possible, event-based manual sampling will also be conducted at all sites so that representative samples across the expected range of stage are collected. The following constituents will be analyzed: nitrate, nitrite, TKN, ammonia, dissolved reactive phosphorus (DRP), Total P, BOD5, fecal coliform and total suspended solids (TSS). In addition, biweekly sestonic Chlorophyll A samples will be taken at each station. The samples will be collected and analyzed in accordance with an approved QAPP. The anticipated level of funding of \$100,000 would cover total costs for the sampling on the three tributary streams for 18 months. The goal of collecting these water quality data is to help calibrate and validate two water quality models (HSPF and QUAL2E) being developed by the Illinois State Water Survey under contract to FRSG. These models will be used to forecast outcomes of changes in flow volumes and loading to assist with watershed plan development/updates for the Fox River and tributaries. Watershed models are an especially useful tool for tributary watersheds where preventative actions such as the incorporation of best management practices in new developments can be evaluated for their benefits via reduction in pollutant loadings associated with conventional development patterns.

As required by the Bureau of Water's Quality Assurance Project Plan: Integrated Water Monitoring Program document (1994) the UIC will develop a Secondary Data QAPP to be reviewed and approved by Illinois EPA, due August 1, 2009.

Project start date: July 1, 2009
Project end date: August 1, 2011

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Attachment A

Final Scope of Work

Precision Estimates for Illinois Indexes of Biotic Integrity

Scope of Work

Illinois Environmental Protection Agency

Precision Estimates for Illinois Indexes of Biotic Integrity

The contract provides for development of a technical report that determines precision of the macroinvertebrate Index of Biotic Integrity (macroinvertebrate-IBI) and of the fish Index of Biotic Integrity (fish-IBI). These indexes are primary measures of biological condition used by the Illinois Environmental Protection Agency (Illinois EPA).

Anticipated duration of the agreement is through December 31, 2009.

Macroinvertebrate-IBI precision estimates and report	\$10,000.00
Fish-IBI precision estimates and report	\$10,000.00
Total cost	\$20,000.00.

Tasks and Products:

The contracted party will conduct a pre-analysis conference call with Illinois EPA Surface Water Section technical staff to discuss data formatting needs, data transfer and analysis expectations, and limitations.

Surface Water Section staff will provide macroinvertebrate- and fish-assemblage samples that represent replicates, i.e., for each assemblage type, two or more samples collected from the same site during a period in which the level of human impact at the site is assumed to be constant. Data will be provided in the previously agreed upon format.

Across as wide a scoring range as practicable, the analysis will determine the minimum magnitude of departure (e.g., IBI score ± 10) that represents a meaningful difference between two IBI scores or between an IBI score and a threshold score. The contracted party will make this determination for both the fish IBI and the macroinvertebrate IBI. The contracted party will examine index precision by performing traditional interval tests (t-tests, confidence intervals, and nonparametric equivalents) and equivalence tests, which test for equivalence of a value rather than a difference. Precision estimates will be in the form of an IBI score $\pm x$, where x is a range of scores within which biotic integrity does not meaningfully differ. The analysis will determine:

- a) the minimum magnitude of departure (e.g., IBI score ± 10) that represents a meaningful difference between an IBI score and a predefined threshold score; and

b) the minimum magnitude of departure (e.g., IBI score ± 10) that represents a meaningful difference between two IBI scores.

The contracted party will conduct a post-analysis conference call with Surface Water Section technical staff to discuss results, analysis limitations, interpretations, and conclusions.

The contracted party will submit a draft report (a combined report is adequate) for review by Surface Water Section technical staff.

After consideration of the review by Surface water Section technical staff, the contracted party will submit a final report to the Surface Water Section.

Schedule of Tasks:

Illinois EPA will provide fish and macroinvertebrate data to the contracted party by July 15, 2009. Data will be in electronic format and will consist of metric and index scores for each macroinvertebrate and fish sample.

The contracted party will conduct analysis and provide a draft technical report by October 31, 2009.

Illinois EPA will provide comments by November 31, 2009.

The contracted party will provide final report by December 31, 2009.

Attachment B

**Upper Mississippi River Clean Water Act Planning and Coordination:
Improving Water Quality Standards and Assessment, Evaluating Nutrient Impacts & Nutrient Monitoring, and
Fostering Inter-Program Collaboration**

***A Water Quality Management Planning Grant Proposal
from the Upper Mississippi River Basin Association***

June 4, 2009

I. INTRODUCTION AND ORGANIZATIONAL BACKGROUND

The Upper Mississippi River Basin Association (UMRBA) is a regional interstate organization formed by the Governors of Illinois, Iowa, Minnesota, Missouri, and Wisconsin to coordinate the states' river-related programs and policies and work with federal agencies that have river responsibilities. UMRBA is involved with programs related to ecosystem restoration, hazardous spills, and water quality, as well as floodplain management and flood control, commercial navigation, and water supply.

The states of the Upper Mississippi River (UMR) have identified UMRBA as the most appropriate entity through which to coordinate their Clean Water Act programs for the River, as expressed in the 2006 report *Organizational Options for Interstate Water Quality Management on the Upper Mississippi River* and a 2007 joint Governors' statement supporting the coordination of water quality monitoring, assessment, and standards for the UMR through UMRBA. (See <http://www.umrba.org/wq.htm> for more details.)

UMRBA supports and provides staff for two work groups, the Water Quality Task Force (WQTF) and the Water Quality Executive Committee (WQEC), which provide forums for consultation among the five state water quality management agencies, as well as Regions 5 and 7 of the U.S. Environmental Protection Agency (US EPA). Both groups address issues directly related to the states' Clean Water Act (CWA) responsibilities on the Mississippi River as a shared interstate resource, including monitoring, waterbody assessments, listings of impaired waters, and total maximum daily loads (TMDLs). The distinction between the groups is that the WQTF examines issues at a technical/program level, while the WQEC functions at a policy level and seeks to implement the approaches identified by the Task Force. The efforts of these groups have enhanced interstate cooperation in CWA implementation (e.g., adoption of common assessment reaches) and resulted in a number of reports regarding UMR water quality issues.

II. PROPOSAL SUMMARY

UMRBA proposes to work with its five member states and the US EPA to build upon its successful collaboration with the WQEC and WQTF in an ambitious \$252,000 combined project that focuses on three primary efforts for the benefit of the UMR. In summary, these efforts are:

- (1) ***Improving Water Quality Standards and Assessment Approaches for the UMR:*** Develop a biological assessment guidance document to aid the states in integrating biological approaches, including a fish index of biotic integrity (IBI) and other tools, into their CWA assessments of the UMR, with particular attention to the large river considerations presented by the UMR.
- (2) ***Evaluating UMR Nutrient Impacts, Data, and Monitoring Needs:*** Craft a synthesis report that i) summarizes data for key nutrient parameters on the UMR and tributaries, ii) examines what is known about the "local" impacts of nutrients on aquatic life and other designated uses on the UMR from a CWA perspective, and iii) offers recommendations for improved monitoring.
- (3) ***Fostering Inter-Program Collaboration:*** Continue cross-program collaboration and coordination activities with other UMR-focused programs, such as the ecosystem restoration and conservation

programs administered by the United States Army Corps of Engineers (USACE), the United States Department of Agriculture (USDA), other federal agencies, and state agencies.

Details regarding tasks, timelines, and deliverables for each of these project areas are provided in Part IV of this proposal. **All activities described in the proposal will be completed no later than December 31, 2011.** The timelines for each project area assume that grant agreements are executed by August 1, 2009. Delays in executing the grant agreements would, of course, necessitate adjustments to scope and/or schedule.

III. MULTIPLE-STATE NATURE OF PROPOSAL

In recognition of the multi-state nature of the resource and ongoing collaboration among the states to address water quality on the UMR, UMRBA is submitting this integrated proposal to the five UMR states (i.e., Illinois, Iowa, Minnesota, Missouri, and Wisconsin), requesting that each state provide funding through its 604(b) Water Quality Management Planning Grants Program. Consistent with this integrated approach, the proposal calls for each state's grant funds to be allocated proportionately across the three project areas.

The total grant funds requested from each state, across all three project areas, are as follows:

Illinois	= \$110,000
Iowa	= \$50,000
Minnesota	= \$30,000
Missouri	= \$20,000
Wisconsin	= <u>\$42,000</u>
Total	= \$252,000

Cost break outs for the individual project areas are provided in Part IV.

IV. DELINEATION OF TASKS, TIMELINES, AND DELIVERABLES

A. Improving Water Quality Standards and Assessment Approaches for the UMR

The primary focus of the work of both the WQTF and WQEC has been to identify approaches to improve the implementation of the states' CWA programs on the UMR, both to achieve greater interstate consistency and to enhance protection of the river's water quality. One priority for further work at this time is the development and application of biological measures in CWA assessments of the UMR, and this project is designed to produce a guidance document for biological assessments as a key next step in addressing this priority.

UMR CWA Biological Assessment Guidance Document

Task

UMRBA, in close coordination with the WQEC and WQTF, will create a guidance document for the states' consideration in incorporating biological approaches into their aquatic life use assessments on the UMR. The guidance document will address a fish index of biotic integrity (IBI) and other biological assessment tools with particular attention to the large river considerations presented by the UMR.

Approach

Using biological indicators to assess the health of ecological systems, as opposed to relying solely on physical and/or chemical parameters, has the advantages of: 1) allowing the biology to integrate and reflect the impact of multiple stressors; 2) potentially being more cost-effective than constituent-specific monitoring programs; and 3) producing measures that can be communicated more broadly and effectively to the public, for whom the status of biological organisms is generally more accessible than the common metrics for chemical or physical constituents. Multimetric indices, such as indices of biotic integrity (IBIs), are increasingly being used in CWA programs as a tool to assess the health of aquatic ecosystems.

The WQTF is particularly interested in beginning to integrate biology into UMR aquatic life assessments. In particular, fish IBIs developed by US EPA's Environmental Monitoring and Assessment Program (EMAP) and the Wisconsin Department of Natural Resources (DNR) appear to hold promise for application on the main channel of the UMR, and recent work by the Wisconsin DNR has begun to answer important questions about the comparability of these approaches and the effects of sampling protocols on outcomes. Other promising indices with potential applications on the UMR include the macroinvertebrate index developed by the EMAP program and the submersed aquatic vegetation index being developed by the Wisconsin DNR and Minnesota DNR, with the support of EMAP.

In this project, UMRBA seeks to aid the states in operationalizing the use of a fish IBI on the UMR by creating a guidance document to assist states in incorporating a fish IBI into their assessment procedures. The guidance document would also explore the use of other promising indices, including vegetation and macroinvertebrate, for UMR aquatic life assessments. This document would build on existing efforts and would include, but not be limited to, the following:

- 1) A summary of existing biological sampling protocols and IBI methods for the UMR, including discussion of reference conditions embedded in each of the IBI methods.
- 2) A summary and comparison of the results of applying IBI approaches to existing UMR data sets.
- 3) Recommendations, with supporting rationale, to the state CWA programs on:
 - a. IBI(s) recommended for use on the UMR
 - b. Data sets that can be used in calculating the IBI(s)
 - c. Sampling protocols to collect new data in support of the IBI(s)
 - d. Geographic applicability for the IBI (and need for the development of additional indices where no appropriate options exist — such as for the open river reach or off-channel areas)
 - e. Appropriate thresholds for impairment determination when using the IBI(s)
 - f. How IBI(s) should be incorporated into assessment methodologies and/or water quality standards
- 4) Discussion of resources to be utilized and funding needed to implement the ongoing collection of data to support the IBI(s) and their incorporation into state aquatic life use assessments under the CWA.

Deliverables and Timelines

Initial WQTF Work Session with Contractor/UMRBA Staff/Researchers by April 1, 2010

Preliminary Guidance Draft by October 1, 2010

WQTF Work Session to Review and Revise Preliminary Guidance by December 31, 2010

Draft Final Guidance Document Completed by April 1, 2011

WQTF Work Session to Review and Revise Draft Final Guidance by July 1, 2011

Final Guidance Document, with accompanying Summary Flyer, by October 1, 2011

Task Budget

Contractor Support	=	\$84,000
UMRBA Staff Support	=	\$59,500 (includes salary, benefits, and indirect cost for temporary and permanent staff)
Meeting and travel costs	=	\$7,500
Equipment	=	\$2,500
Printing and mailing costs	=	<u>\$3,000</u>
Total	=	\$156,500

State Contributions to Task Budget

Illinois	=	\$68,300
Iowa	=	\$31,000
Minnesota	=	\$18,600
Missouri	=	\$12,500
Wisconsin	=	<u>\$26,100</u>
Total	=	\$156,500

B. Evaluating Nutrient Impacts and Nutrient Monitoring on the UMR

Nutrients levels, primarily of nitrogen and phosphorus, are often cited as a water quality concern for the Mississippi River. However, this concern is most often expressed in terms of the nutrients' impact on hypoxia in the Gulf of Mexico. While Gulf hypoxia is a critical national environmental issue, understanding and documenting the extent of more local water quality impacts is key to informing and motivating action on a state and regional scale. Additionally, existing monitoring efforts may not be designed to fully capture the data needed to assess nutrient levels and impacts on the UMR and its tributaries in a CWA context. This project is designed to summarize key nutrient parameter data for the UMR and its tributaries, synthesize what is known about "local" impacts of nutrients to inform definitions of nutrient impairment in a CWA context, and make recommendations to improve nutrient monitoring on the UMR. In combination, these efforts will ultimately aid states in their nutrient standards development and nutrient control programs.

Synthesis Report on UMR Nutrient Data, Local Nutrient Impacts, and Monitoring Needs from a CWA Perspective Task

UMRBA, in close coordination with the WQEC and WQTF, will review existing data and literature regarding key nutrient parameters and impacts of nutrients within the UMR, from a Clean Water Act perspective. This effort will give particular consideration to the connection between nutrients and aquatic life use support. UMRBA will then synthesize this information into a summary report that will include recommendations for improved nutrient monitoring on the UMR.

Approach

Many efforts are ongoing to assess the levels and impacts of nutrient loading in the Mississippi River Basin on hypoxia in the Gulf of Mexico. There is also important work ongoing by the USGS and the states to collect data and analyze effects of nutrients at much more localized levels, such as the backwaters of individual river pools. However, there is a need to bring together UMR-specific data and research in a CWA context to better understand localized effects and apply this understanding to nutrient reduction efforts.

UMRBA therefore proposes to draft a report that will synthesize existing literature and data into a single summary report that will aid the states in developing and applying nutrient standards and help target nutrient control efforts. It is anticipated that the report will also be a valuable information source for other audiences seeking to understand and improve the UMR's condition. In addition, this report will aid the states' ongoing effort through UMRBA to refine designated uses on the UMR, by helping to identify conditions that support aquatic life uses in various areas of the river. Data sources will include USGS' Long Term Resource Monitoring Program, US EPA's EMAP, state programs, and other efforts. The report will include, but not be limited to, the following components:

- 1) A compilation/synthesis of existing UMR *main stem* nutrient data for key parameters, likely including – but not limited to – phosphorus, nitrogen, and chlorophyll-a.
- 2) A compilation/synthesis of existing UMR *tributary* nutrient data for key parameters, likely including – but not limited to – phosphorus, nitrogen, and chlorophyll-a.
- 3) Based on the data compilation/synthesis, a discussion of trends in nutrient levels in the UMR main stem and in UMR tributaries over time.
- 4) A compilation/synthesis of reported impacts to aquatic life and other designated uses occurring on the UMR main stem, and nutrient levels associated with these impacts.
- 5) Recommendations for enhanced/improved nutrient monitoring on the UMR and its tributaries, based on the review of nutrient levels and reported impacts.

Deliverables and Timelines

Initial meeting with WQTF, key researchers, and other appropriate CWA staff by March 1, 2010

Preliminary Report Draft by July 1, 2010

WQTF Work Session to Review and Revise Report Draft by October 1, 2010

Final Report, with accompanying summary flyer, by January 1, 2011

Task Budget

UMRBA Staff Support = \$56,000 (includes salary, benefits, and indirect cost for temporary and permanent staff)

Meeting and travel costs = \$4,500

Equipment = \$2,500

Printing and mailing costs = \$3,000

Total = \$66,000

State Contributions to Task Budget

Illinois = \$28,800

Iowa = \$13,100

Minnesota =	\$7,900
Missouri =	\$5,200
Wisconsin =	<u>\$11,000</u>
Total =	\$66,000

C. Fostering Inter-program Collaboration

As the WQTF and WQEC continue their important work to improve CWA approaches on the UMR, it is critical that a connection is maintained to other programs with a UMR or basin focus, in order to work most effectively and efficiently for the health of the system. This includes interfacing with other UMR and basin-focused programs, such as those administered by USACE and USDA, to present CWA-informed water quality perspectives, encourage the consideration of these perspectives in project design/selection, and seek shared goals for ecosystem health. UMRBA is uniquely positioned to help facilitate this ongoing dialogue, as evidenced by workshops it held in 2008 and 2009 that brought together CWA and ecosystem restoration program staff to explore avenues for cooperation both generally and specifically in regard to biological indicators

Cross-Programmatic Workshops

Task

UMRBA, in close coordination with the WQEC and WQTF, will host two workshops in support of continued cross-programmatic collaboration on the UMR. The focus will include involving CWA, ecosystem restoration, and conservation programs administered by US EPA, USACE, USDA, other federal agencies, and state agencies.

Approach

UMRBA will examine the outcomes and recommendations of its 2008 and 2009 cross-programmatic workshops and will work with the funders of these workshops (US EPA and USACE), as well as the WQTF and WQEC, to determine the most appropriate next topics for inter-program coordination. Objectives of these workshops may include, but would not be limited to: engaging USDA representatives and stakeholders more actively in these coordination efforts; continuing work initiated at the May 2009 biological indicators workshop, examining tributary issues; collaborating on restoration objective-setting; discussing UMR monitoring approaches; or focusing on emerging, cross-cutting issues (e.g. climate change, invasive species, emerging contaminants, hydrokinetic installations).

Deliverables and Timelines

Hold two workshops by October 1, 2011.

For each workshop, deliverables will include workshop agendas and final workshop reports, with final reports completed by December 31, 2011.

Task Budget

UMRBA Staff Support	=	\$13,500 (includes salary, benefits, and indirect cost for permanent staff)
Meeting and travel costs	=	\$14,000
Printing and mailing costs	=	<u>\$2,000</u>
Total	=	\$29,500

State Contributions to Task Budget

Illinois = \$12,900

Iowa = \$5,900

Minnesota = \$3,500

Missouri = \$2,300

Wisconsin = \$4,900

Total = \$29,500